



# WMD and Terrorism Awareness in the Contemporary Operational Environment

By Mr. Jon H. Moilanen

*“... one of the greatest dangers we continue to face is the toxic mix of rogue nations; terrorist groups; and nuclear, chemical, or biological weapons. North Korea and Iran present uniquely vexing challenges in this regard. North Korea has produced enough plutonium for several atomic bombs; Iran is developing the capabilities needed to support a nuclear weapons program.”*

—Secretary of Defense Robert M. Gates<sup>1</sup>

The above statement, issued by Secretary of Defense Gates, acknowledges the growing threat of weapons of mass destruction (WMD) and identifies actors who have them or seek to obtain them. In addition to these nation-states, terrorists who might use WMD as a means to promote their extremist agendas also pose a significant threat.

In early 2009, Mr. Dennis C. Blair, Director of National Intelligence, noted that deterrence and diplomacy have traditionally constrained the use of WMD by most nation-states. Yet, some terrorist groups are not bound by such constraints. Expanding opportunities for terrorists to obtain chemical, biological, radiological, and nuclear (CBRN) materiel represent a significant threat to the United States and its partners. Intentions for the acquisition and use of WMD are evident in terrorists,

ranging from transnational groups (such as al-Qaida) to lone individuals.<sup>2</sup> The target of an attack might be within the United States or in any other area of U.S. presence around the world.

## Definition of the WMD Threat

How do Soldiers and leaders recognize the threat of WMD and terrorism? They must know which conditions, circumstances, and influences<sup>3</sup> of their immediate operational environment affect military operations. The threat of terrorism is routinely assessed during recurring military tasks and missions. To provide a source of situational knowledge regarding foreign and domestic terrorism threats and to warn of possible WMD use against the United States, the U.S. Army Training and Doctrine Command (TRADOC) Deputy Chief of Staff for Intelligence

(G-2) publishes a series of informational handbooks that support organizational and individual antiterrorism training, military education, and operational missions.

Although various definitions are available, the Department of Defense (DOD) defines WMD as “weapons that are capable of a high order of destruction and/or of being used in such a manner as to destroy large numbers of people” and specifically indicates that WMD may include high-yield explosives and nuclear, biological, chemical, or radiological weapons.<sup>4</sup> DOD defines terrorism as “the calculated use of unlawful violence or threat of unlawful violence to inculcate fear.” Terrorism is intended to coerce or to intimidate governments or societies in the pursuit of goals that are generally political, religious, or ideological.<sup>5</sup>

### TRADOC G-2 Terrorism Handbook Series

The focus of the TRADOC G-2 Intelligence Support Activity (TRISA) terrorism handbook series is on the threat of terrorism. TRADOC G-2 Handbook No. 1 is the capstone handbook of this antiterrorism-oriented series.<sup>6</sup> TRADOC G-2 Handbook No. 1.04 contains more details about the threat of WMD.<sup>7</sup> It recognizes that a full spectrum threat can be foreign or domestic, describes the categories and characteristics of WMD, and discusses special considerations such as dual-use technology, toxic industrial material, and genetic engineering. It concludes with information about how the threat or enemy thinks, operates, and considers possible U.S. armed forces vulnerabilities. Both of these handbooks are periodically updated with contemporary assessments.

Other TRADOC G-2 handbooks complement TRADOC G-2 Handbook No. 1.04. For example, TRADOC G-2 Handbook No. 1.01 contains six detailed case studies of terrorism, including three incidents involving WMD—the sarin attack on

the Tokyo subway system (1995), the domestic bombing of the Alfred P. Murrah Federal Building (1995), and the bombing of the Khobar Towers in Saudi Arabia (1996).<sup>8</sup>

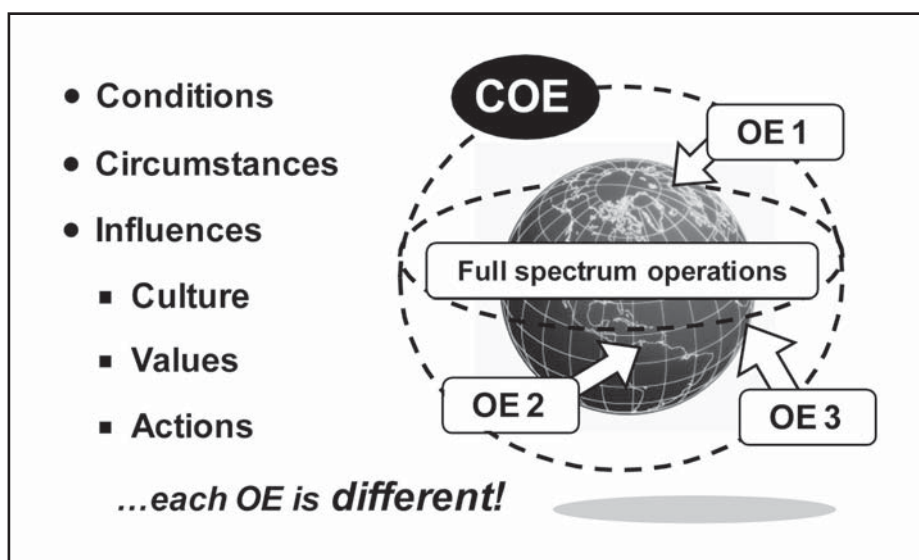
### Situational Awareness and Understanding

An understanding of the WMD terrorism threat requires the collection and analysis of information. These tasks are completed through intelligence preparation of the battlefield, which results in increased situational awareness and situational understanding and acts as a catalyst for leader decisionmaking. Situational awareness refers to the immediate knowledge of the conditions, circumstances, and influences of a mission. Relevant relationships among mission variables and critical judgment create situational understanding and facilitate decisionmaking.<sup>9</sup>

Mission variables include political, military, economic, social, information, infrastructure, physical environment, and time (PMESII+PT).<sup>10</sup> Through situational understanding, it is possible to identify gaps in information, threats to the force or mission accomplishment, threat or enemy options and likely future actions, operational opportunities, probable consequences of proposed friendly force actions, and probable effects of the operational environment on the mission. This continuum of information helps refine what is known and unknown about a threat or enemy.<sup>11</sup>

### Contemporary Operational Environment

The contemporary operational environment (COE) refers to the collective set of conditions derived from a comprehensive assessment of actual worldwide conditions affecting military operations. The operational variables of conditions, circumstances, and influences pose realistic challenges for training, leader development, and capability development for



Dynamics of COE awareness

Army forces and their joint, intergovernmental, interagency, and multinational partners. COE is not an artificial construct created just for training; it is a representative composite of variables that affect the conduct of U.S. generating and operating force missions. COE is an overarching concept for relevant aspects of operational environments that exist now or could exist in the next ten to fifteen years.<sup>12</sup>

The following operational settings may be considered when relating levels of risk management, protection, operational security, and antiterrorism measures to generating and operating forces:

- On deployment to an operational mission.
- In transit to or from an operational mission.
- In installation or institutional support not normally deployed in the conduct of an organizational mission.

### Description of the WMD Threat

The principal means of WMD addressed in the TRADOC G-2 handbooks is CBRN.<sup>13</sup> The addition of high-yield explosives to this list of potential hazards results in what is known as chemical, biological, radiological, nuclear, and high-yield explosives (CBRNE).<sup>14</sup> Incidents can involve accidental releases, toxic industrial material, biological pathogens, radioactive matter, and high-yield explosives that can cause devastating effects on a target.<sup>15</sup> The confirmation of a WMD terrorist attack may not occur until well after the incident takes place.

#### Chemical Vector

The threat of a chemical attack by terrorists is derived from two possible primary sources—the acquisition of militarized chemical weapons and delivery systems and the demonstrated ability to manufacture improvised chemical agents and means of dissemination. Dual-use material and advanced technologies obtained by terrorist groups increase the danger. While dual-use material and advanced technologies have legitimate practical

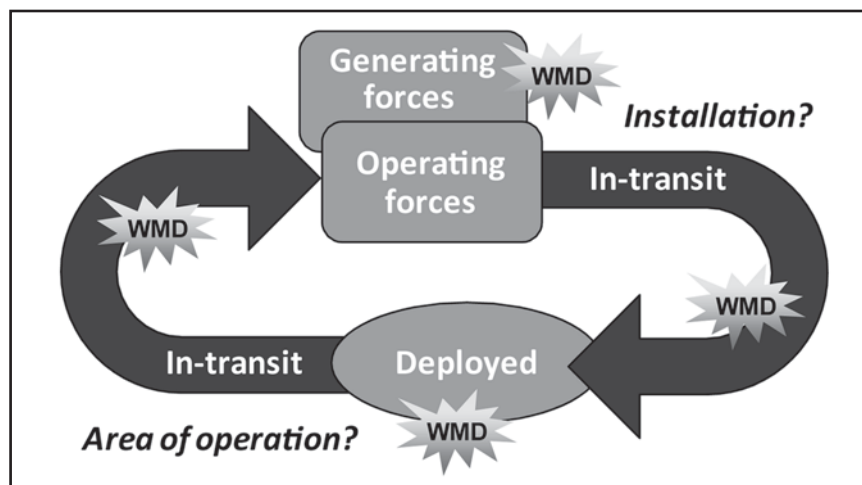
uses in commerce, medicine, and science; they warrant conscientious monitoring and control when they can be used to produce WMD.

Previous terrorist attempts at WMD production have exposed the difficulty in weaponizing CBRN material for mass disruption or destruction. Nonetheless, in 1995, the Japanese cult Aum Shinrikyo manufactured the chemical nerve agent sarin and released it in the Tokyo subway network—killing 12 people and injuring 5,500 others.<sup>16</sup> Even the Aum Shinrikyo attack demonstrated the unpredictable nature of chemical weapons and problematic issues of dissemination. Fortunately, the effects were much less deadly than what the terrorists had planned.

Nation-states have used chemical weapons with mass destruction effects against their own people. For example, in 1987 and 1988, Saddam Hussein directed Iraqi military forces to use chemical weapons against the Kurdish population in northern Iraq. About forty chemical weapons attacks took place during the eighteen-month campaign. Mustard (a blister agent) and sarin, tabun, and VX nerve agents were employed in aerial bombs, 122-millimeter rockets, aerial spray dispensers on aircraft, and conventional artillery shells and used as weapons of terror.<sup>17</sup> A chemical attack on the city of Halabja in March 1988 resulted in about 5,000 civilian deaths and a corresponding number of chemical injuries.

#### Biological Vector

Biological weapons may consist of pathogenic microbes, toxins, or bioregulator compounds. Pathogens are disease-producing microorganisms such as bacteria, rickettsiae, and viruses; they occur naturally, but can be altered using biotechnology. Toxins are poisons that are formed naturally by animals and vegetables, but they may also be synthetically produced. Bioregulators affect cellular processes in the body. Depending on the specific compositions of biological weapons,



Where is the WMD threat?



**Tokyo sarin attack (1995)**

they can incapacitate or kill people and animals and destroy plants, food supplies, and materiel.

Critical factors to consider in conjunction with the use of biological weapons include the incubation period of the biological agent, degree and duration of incapacitation, and other short- and long-term effects that may result. Terrorists may take these factors into account in planning the attack. The incubation period determines the length of time it takes for symptoms of the biological agent to become evident and, consequently, to correctly diagnose the incident as an attack.

A pathogen, such as anthrax, could be used against various targets, including population centers, food and water supplies, economic sites, and other infrastructure. Anthrax invades in one of three ways—through the skin (dermal absorption), the digestive system (ingestion), or the lungs (inhalation), with inhalation being the most serious route of attack. The incubation period for anthrax may be several days, depending on conditions. Decontamination, long-term medical treatment for physical and psychological issues, and economic disruption add to the immediate effects of an attack.

#### ***Radiological Vector***

Radioactive material is widely used in medical, commercial, industrial, and research facilities. It can be incorporated into a “dirty” bomb that is designed to disperse the radioactive materials. Radioactive material can be distributed in the atmosphere or in a confined area such as an office ventilation system through the use of a radiological dispersal device. Aircraft can be used to disperse radioactive powders or aerosols.<sup>18</sup> A radiation-emitting device can be used as a passive method of radiological attack. The radiation-

emitting device can be set up to expose a certain population to intense radiation for a short period of time or to low levels of radiation over an extended period. The knowledge of such contamination and the fear of physical injury or psychological harm can be significant.<sup>19</sup>

Disaster response and recovery issues associated with a radiological attack include the medical treatment of people in the affected area, the possible evacuation and relocation of populations, and the return of physical property and materiel to a useable state with no fear of radiation.<sup>20</sup> Although not an act of terrorism, an incident that took place in Goiânia, Brazil, in 1987 illustrates the impact of a little more than one ounce of the radioactive isotope cesium-137. Its dispersal resulted in injuries, deaths, and significant contamination of property. More than 100,000 people were screened for radioactive contamination. Short-term symptoms included skin burns, and many people developed radiation-associated illnesses. More than twenty people were hospitalized. Evaluations for long-term health issues, such as increased incidences of cancer, are ongoing. More than 6,000 tons of household belongings and other materials were packed in concrete-lined steel containers and placed in a restricted area.<sup>21</sup> Extensive decontamination and medical treatment continued for several years.

#### ***Nuclear Vector***

Nuclear material represents a distinct danger, but the production of a weaponized nuclear device requires exceptional technical expertise and capabilities and access to fissile material. It is very difficult, but possible, for terrorists to obtain nuclear material. Avenues that terrorists might pursue to gain access to nuclear technologies and materiel may include international nuclear weapons technology proliferation networks such as the



**Goiânia incident (1987)**

A.Q. Khan network, state sponsors of terrorism, transnational criminal groups, and other illegal activity.

### Identification of Threat Actors

In an unclassified report to Congress, the Central Intelligence Agency stated that many of the more than thirty designated foreign terrorist organizations have expressed interest in acquiring WMD.<sup>22</sup> The *National Defense Strategy*<sup>23</sup> identifies rogue states such as Iran and North Korea as a threat to international order; Iran sponsors terrorism while continuing to build nuclear technology and enrichment capabilities. And although North Korea was recently removed from the U.S. Department of State list of terrorism sponsors, it remains a serious nuclear and missile proliferation threat. Recent threats publicized by North Korea highlight the increasing danger of its use of nuclear weapons and proliferation of supporting technologies.<sup>24</sup> Concerns about the possibility of nonstate actors acquiring WMD through clandestine production, state sponsorship, or theft continue.<sup>25</sup>

The most dangerous type of terrorist threat to the United States is a transnational movement that exploits religious extremism for ideological ends. The U.S. Government considers the al-Qaida network the most serious transnational threat to the United States. Targets and methods of attack will most likely continue to be economic in nature, involving commercial aviation, the energy sector, or mass transportation.<sup>26</sup> According to Mr. Blair, al-Qaida would “. . . use any CBRN capability it acquires in an anti-U.S. attack, preferably against the Homeland.”<sup>27</sup> As security measures make attacks on particular targets more difficult, other less protected targets such as large public gatherings or locations of symbolic monuments or notable buildings may be chosen.<sup>28</sup>

Emergent actions indicate that terrorism which was previously centralized and controlled by formal networks and organizations is increasingly conducted by loosely affiliated terrorists or groups of terrorists that may generally align themselves with an ideology or special-interest agenda. These terrorists are often interested in conducting unconventional attacks. Some declare that their acquisition of WMD is a religious duty (extremist ideology) and threaten to use WMD to influence political actions, achieve specific economic or financial objectives, or leverage other types of concessions. Some groups wish to employ WMD to create large numbers of military and civilian casualties and to capitalize on the psychological effects of these events.<sup>29</sup>

A prominent case in which lone terrorists used WMD occurred on 19 April 1995, when Timothy McVeigh and Terry Nichols bombed the Alfred P. Murrah Federal Building in Oklahoma City, Oklahoma. Their truck bomb was a relatively simple device composed of several thousand pounds of ammonium nitrate fertilizer, explosives, and other materials.<sup>30</sup> The effects were devastating—the blast and immediate aftermath killed 168 men, women, and children and injured more than 800 others. The explosion also severely damaged a large area of downtown Oklahoma City.

Another significant case involving a lone terrorist occurred in 2001. Anthrax spores were distributed through the U.S. postal system in a biological attack that caused five deaths and injured seventeen others. Significant psychological stress overshadowed the more obvious physical impacts of the attack. In 2008, the U.S. Department of Justice (DOJ) announced that Dr. Bruce Ivins, a DOD microbiologist, was solely responsible for the attack.<sup>31</sup>

### Sharing of Awareness, Understanding, and Expertise

TRISA hosts an informal, electronic consortium which connects an expanding network of users and subject matter experts who share awareness, understanding, and expertise and collaborate on training, education, and operational issues. In this Threats Terrorism Team (T3) network, threat and terrorist information is shared among members of the U.S. Joint Staff; Army Staff; U.S. Army North (as the Army component of the U.S. Northern Command); U.S. Army Installation Management Command; First Army (as it mobilizes, trains, validates, and deploys Reserve Component units or provides training to joint, combined, and Active Army forces as part of the U.S. Army Forces Command); and U.S. departmental, interdepartmental, interagency, and intergovernmental offices.

TRADOC schools and centers provide an excellent means for bridging training and professional education readiness with operational readiness in organizational units and institutional garrisons, sites, and activities. Relevant training is available at the U.S. Army Sergeants Major Academy; U.S. Army Warrant Officer Career College; U.S. Army Command and General Staff College; Army Intelligence Center; and U.S. Army Infantry, Armor, CBRN, and Military Police Schools. As the proponent for Army antiterrorism officer training, the U.S. Army Military Police School uses the TRADOC G-2 terrorism handbooks in their curricula.

Other armed Services also use the TRADOC G-2 terrorism handbook series. These organizations include the U.S. Navy Center for Security Forces, U.S. Air Force Security Forces Center, and U.S. Marine Corps Training and Education Command. Information sharing among the U.S. Army, Navy, Air Force, Marine Corps, and Coast Guard is fundamental in improving Homeland security; Homeland defense; and offensive, defensive, and stability operations in the midst of a long war that includes enemy terrorism.

### Future Situational Understanding

An understanding of the enemy and WMD acts of terrorism is critical to the success of future antiterrorism and counterterrorism missions undertaken by friendly forces, allies, and coalition partners. The TRADOC G-2 terrorism handbooks can help establish situational awareness and understanding of current terrorist threats, capabilities, and limitations and also those of the future. Because the handbooks are updated regularly, they are living documents that may be consulted during recurring assessments and action

in institutional and operational mission areas in the United States and abroad. The TRADOC G-2 terrorism handbook series is a critical Soldier and leader antiterrorism tool for institutional organizations, in-transit forces and activities, and deployed operational units.

#### Endnotes:

<sup>1</sup>Robert M. Gates, "Submitted Statement on DOD Challenges to the Senate Armed Services Committee," 27 January 2009, <<http://www.defenselink.mil/speeches/speech.aspx?speechid=1337>>, accessed on 3 September 2009.

<sup>2</sup>Dennis C. Blair, "Annual Threat Assessment of the Intelligence Community for the Senate Select Committee on Intelligence," 12 February 2009, <<http://intelligence.senate.gov/090212/blair.pdf>>, accessed on 8 September 2009.

<sup>3</sup>Joint Publication (JP) 3-0, *Joint Operations*, 17 September 2006.

<sup>4</sup>JP 1-02, *Department of Defense Dictionary of Military and Associated Terms*, 12 April 2001 (as amended through 17 March 2009).

<sup>5</sup>Ibid.

<sup>6</sup>TRADOC G-2 Handbook No. 1, *A Military Guide to Terrorism in the Twenty-First Century*, 15 August 2007.

<sup>7</sup>TRADOC G-2 Handbook No. 1.04, *Terrorism and WMD in the Contemporary Operational Environment*, 20 August 2007.

<sup>8</sup>TRADOC G-2 Handbook No. 1.01, *Terror Operations: Case Studies in Terrorism*, 25 July 2007.

<sup>9</sup>Field Manual (FM) 3-0, *Operations*, 27 February 2008.

<sup>10</sup>JP 3-0 and FM 2-0, *Intelligence*, 17 May 2004.

<sup>11</sup>FM 2-0 and FM 3-0.

<sup>12</sup>"COE Definition," TRISA-Contemporary Operational Environment and Threat Integration Directorate (CTID) e-mail message, 22 January 2009. (See also "Operational Environment 2009–2025," TRADOC White Paper, August 2009.)

<sup>13</sup>"Country Reports on Terrorism," U.S. Department of State, Office of the Coordinator for Counterterrorism, 30 April 2008, <<http://www.state.gov/s/ct/rls/crt/2007/103703.htm>>, accessed on 9 September 2009.

<sup>14</sup>Field Manual Interim (FMI) 3-90.10, *Chemical, Biological, Radiological, Nuclear, and High-Yield Explosives Operational Headquarters*, 24 January 2008.

<sup>15</sup>JP 1-02.

<sup>16</sup>Walter Laqueur, *The New Terrorism: Fanaticism and the Arms of Mass Destruction*, Oxford University Press, New York, 1999.

<sup>17</sup>"WMD: The Deadliest Threat of All," *Iraq: From Fear to Freedom*, International Information Programs, U.S. Department of State, 7 January 2006, <<http://wanews.org/docs/wmd.htm>>, accessed on 10 September 2009.

<sup>18</sup>"Radiological Attack: Dirty Bombs and Other Devices," *News & Terrorism: Communicating in a Crisis*, A Fact Sheet From the National Academies and the U.S. Department of Homeland Security, undated, <[http://www.nae.edu/NAE/pubundcom.nsf/weblinks/CGOZ-646NVG/\\$file/radiological%20attack%2006.pdf](http://www.nae.edu/NAE/pubundcom.nsf/weblinks/CGOZ-646NVG/$file/radiological%20attack%2006.pdf)>, accessed on 10 September 2009.

<sup>19</sup>"Introduction to Radiological Terrorism," *Radiological Terrorism Tutorial*, prepared for the Nuclear Threat Initiative by the Center for Nonproliferation Studies, Monterey Institute of International Studies, Monterey, California, 2004, <[http://www.nti.org/h\\_learnmore/radtutorial/chapter01\\_02.html](http://www.nti.org/h_learnmore/radtutorial/chapter01_02.html)>, accessed on 10 September 2009.

<sup>20</sup>"Effects of Radiological Terrorism," *Radiological Terrorism Tutorial*, prepared for the Nuclear Threat Initiative by the Center for Nonproliferation Studies, Monterey Institute of International Studies, Monterey, California, 2004, <[http://www.nti.org/h\\_learnmore/radtutorial/chapter02\\_02.html](http://www.nti.org/h_learnmore/radtutorial/chapter02_02.html)>, accessed on 10 September 2009.

<sup>21</sup>Don Philpott, "Lesson Learned: Silent Killer—Goiânia, Brazil's Radiation Disaster!" *Homeland Defense Journal*, Volume 2, April 2004. (For additional information, see *The Radiological Accident in Goiânia*, International Atomic Energy Agency, Vienna, Austria, 1988, <[http://www-pub.iaea.org/MTCD/publications/PDF/Pub815\\_web.pdf](http://www-pub.iaea.org/MTCD/publications/PDF/Pub815_web.pdf)>, accessed on 10 September 2009.)

<sup>22</sup>"Unclassified Report to Congress on the Acquisition of Technology Relating to Weapons of Mass Destruction and Advanced Conventional Munitions, 1 January Through 30 June 2003," Director of Central Intelligence, <[http://www.fas.org/irp/threat/cia\\_jan\\_jun2003.htm](http://www.fas.org/irp/threat/cia_jan_jun2003.htm)>, accessed on 10 September 2009.

<sup>23</sup>*National Defense Strategy*, U.S. Department of Defense, June 2008.

<sup>24</sup>"North Korea Would Use Nuclear Weapons in a 'Merciless Offensive,'" *The Independent*, 9 June 2009, <<http://www.independent.co.uk/news/world/asia/north-korea-would-use-nuclear-weapons-in-a-merciless-offensive-1700590.html>>, accessed on 11 September 2009.

<sup>25</sup>*National Defense Strategy*.

<sup>26</sup>Robert S. Mueller III, "Statement Before the Senate Select Committee on Intelligence," Congressional Testimony, 11 January 2007, <<http://www.fbi.gov/congress/congress07/mueller011107.htm>>, accessed on 11 September 2009.

<sup>27</sup>Blair, 12 February 2009.

<sup>28</sup>Mueller, 11 January 2007.

<sup>29</sup>National Security Presidential Directive (NSPD)-17, *National Strategy to Combat Weapons of Mass Destruction*, December 2002, <<http://www.fas.org/irp/offdocs/nspd/nspd-17.html>>, accessed on 11 September 2009.

<sup>30</sup>Lou Michel and Dan Herbeck, *American Terrorist: Timothy McVeigh and the Oklahoma City Bombing*, HarperCollins Publishers, Inc., New York, 2001.

<sup>31</sup>Jeffrey Taylor and Joseph Persichini, "Transcript: DOJ News Conference on Bruce Ivins," 8 August 2008, <<http://www.npr.org/templates/story/story.php?storyId=93415845>>, accessed on 11 September 2009.

---

Mr. Moilanen is a senior military analyst, researcher, and writer with the MPRI Division of L-3 Communications at TRISA. He is also a retired U.S. Army colonel. Mr. Moilanen holds a bachelor's degree from the University of Wisconsin–Oshkosh and a master's degree from Indiana University of Pennsylvania. He is currently pursuing a doctorate degree in adult education from Kansas State University.